Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Pearson Creek

Waterbody Segment at a Glance:

County: Greene
Nearby Cities: Springfield
Length of impairment: 1.5 miles
Pollutant: Unknown Toxicity
Source: *

*The U.S. Environmental Protection Agency did not specify a source for this listing

TMDL Priority Ranking: Medium


State map showing location of watershed

Description of the Problem

Beneficial uses of Pearson Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life and
- Protection of Human Health associated with Fish Consumption
- Whole Body Contact Recreation (Swimming)

Use that is impaired

- Protection of Warm Water Aquatic Life
- Whole Body Contact Recreation (Swimming)

Standards that Apply

- In Missouri's Water Quality Standards (WQS), 10 CSR 20-7.030 (3)(D) and (G), the general criteria state that:
  - Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.
  - Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

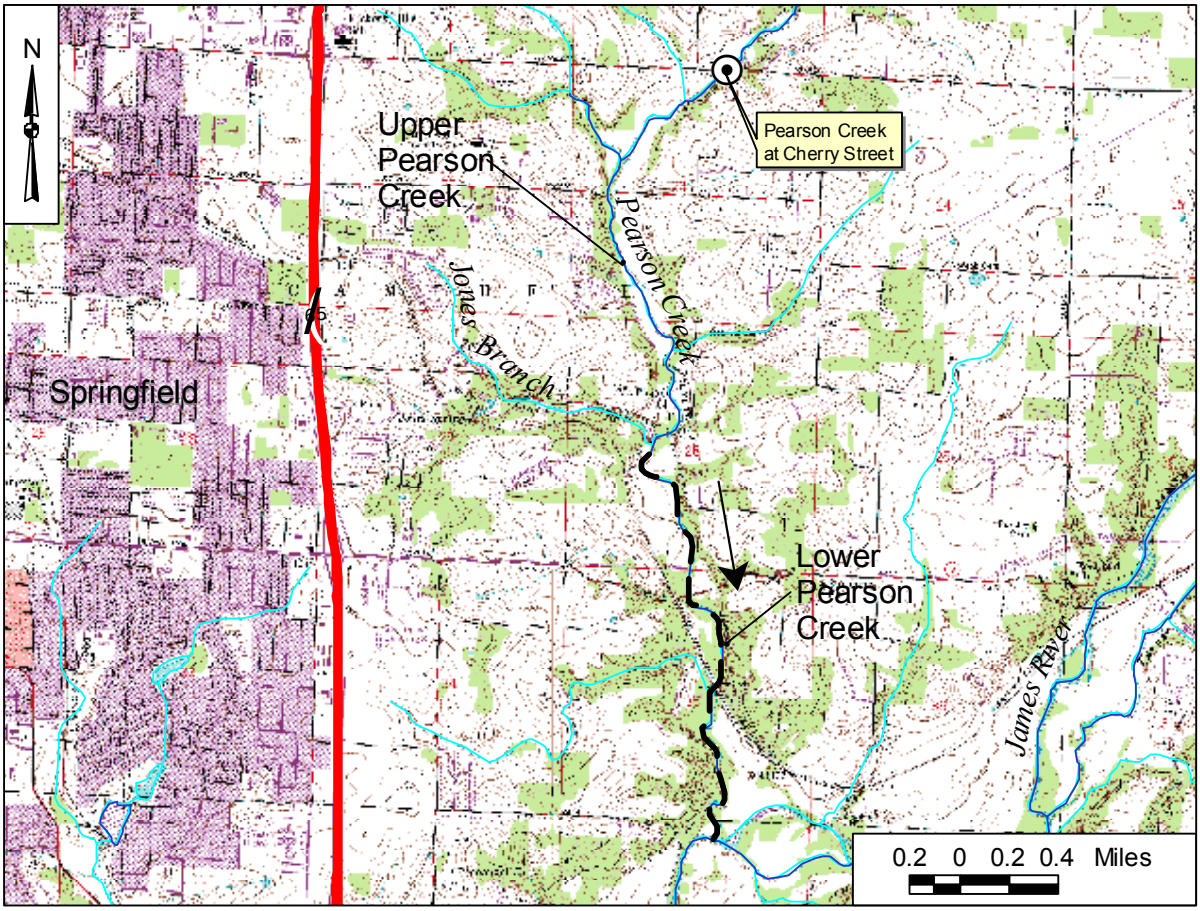
Background Information and Water Quality Data

Pearson Creek (also spelled Pierson) drains a 23.4 square mile watershed. The northern and eastern portions of the watershed are primarily agricultural lands. Agricultural activities include dairy farming and pasturing beef cattle. The western and southern portions of the watershed consist primarily of urban development, located on the eastern edge of Springfield, Missouri. Pearson Creek joins the James River just above the municipal drinking water intake. Output from springs

provides a significant amount of flow to the creek. Pearson Creek is on the 303(d) list for unknown toxicity, so more data is needed to clarify the problem(s). The primary evidence of impairment in Pearson Creek comes from long term monitoring by biologists with the city's drinking water provider, City Utilities of Springfield. Their data shows a significant reduction in the number of aquatic invertebrate species (like crayfish and water insects) between the 1960s and the 1990s. To try and identify the unknown toxicity and its source(s), the U.S. Geological Survey (USGS) completed a water quality study of the Springfield urban area in 2000. This study focused on heavy metal and organic toxicants in normal and stormwater flows in Wilsons and Pearson creeks. It revealed the presence of many potentially toxic chemicals. However, none of these chemicals were found in concentrations large enough to exceed state standards for protecting aquatic life. Meanwhile, the Stormwater Permit for the City of Springfield was issued July 2002. After 18 months of monitoring the stormwater (a requirement of the permit), no exceedences of the WQS were noted and no toxicity discovered. The department met with Springfield officials in October 2004, and the city agreed to modify their monitoring to include toxicity testing modeled after the work being done on Hinkson Creek in Boone County. Hinkson Creek is also polluted by unknown toxicity. Using toxicity testing in that creek is successfully identifying potentially toxic parameters that are not usually analyzed. This approach will be applied to Wilsons and Pearson creeks to help identify the unknown pollutants.

Map and data tables may be found below.

Pearson Creek in Greene County, Missouri



Impaired Segment Direction of Flow

Average Aquatic Biological Diversity in Pearson Creek, 1984-1992

	Number of EPT taxa[1]	Biotic Index[2]	Number of taxa per 100 organisms
Upper Pearson Creek	29	26	17
Lower Pearson Creek	14	28	14

[1] Orders Ephemeroptera (Mayflies), Plecoptera (Stoneflies), and Trichoptera (Caddisflies), which are pollution intolerant.
[2] Based on numbers of taxa and number of individuals within each taxon per sample
Source: City Utilities of Springfield

Historical Changes in Aquatic Macroinvertebratees in Lower Pearson Creek

	1964-1965	1992
Biotic Index[1]	28.7	27.7
Number of taxa per 100 organisms	17.5	14.5
Total number of taxa	24.5	17.8
Number of EPT taxa[2]	12.8	5.8

[1] Based on numbers of taxa and number of individuals within each taxon per sample
[2] Orders Ephemeroptera (Mayflies), Plecoptera (Stoneflies), and Trichoptera (Caddisflies)
Source: City Utilities of Springfield

Total Number of Taxa in Pearson Creek at Cherry Street

Year	Total Taxa
1992	24
1999	20
2001	17

Source: City Utilities of Springfield

For more information call or write:
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